

TOBACCO INDUSTRY RESEARCH COMMITTEE

Committee:

Wilson, Chm.
Little
Cattell
(Tagiuri)

150 East Forty Second Street

New York 17, New York

#284

Cf. #220

Activated: 6/1/'59

Application For Research Grant

Date: July 12, 1960

1. Name of Investigator: James G. Miller, M.D., Ph.D.
2. Title: Professor of Psychiatry and Psychology, and Director
of the Mental Health Research Institute
3. Institution &
Address: The University of Michigan
Ann Arbor, Michigan
4. Project or Subject: "The Effects of Nicotine on Behavior, Under Stress
and Normal Conditions, in Smokers and Nonsmokers."
5. Detailed Plan of Procedure:

A study just completed by Srivastva and myself has shown certain positive findings. Light smokers showed significantly less anxiety than either heavy smokers or non-smokers, but nevertheless heavy smokers carried out behavioral tasks better than light smokers. There were significant differences in autonomic responses, the light smokers having higher Galvanic Skin Response scores under various experimental conditions than the heavy smokers, suggesting that the autonomic nervous systems of light smokers might be more responsive than the heavy smokers'.

We propose to follow up this research by a further investigation to determine the behavioral effects of nicotine ingested orally upon performance in a series of behavioral tests.

Thirty or more apparently normal subjects will be used divided equally between smokers and nonsmokers. Before each battery of tests the subject will be given a capsule of nicotine or a placebo to be provided by the Tobacco Industry Research Committee. It is understood that the amount of nicotine in the capsule will be a reasonable quantity to provide definite nicotine effect in smokers and yet not enough to nauseate or otherwise incapacitate nonsmokers. At the appropriate period of time after ingestion of the capsule to assure a peak nicotine effect, the subject will be given a battery of behavioral tests. If the nicotine effect wears off too rapidly the test will be given on more than one occasion until they are all completed.

The tests will include the following: Our driving battery including the AAA Driver Trainer, the Bausch and Lomb Orthorater to measure visual function, and the steadiness test. These tests have been repeatedly used by us on subjects under various tranquilizers and other centrally active drugs so that we have comparative data on them

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for other compounds besides nicotine. We shall also use tests which concern the speed of information processing in the nervous system such as the reaction time, the estimation of the subjective second, and perhaps the IOTA apparatus in at least some subjects.

Where possible each of these tests will be given repeatedly under stress and nonstress conditions. All testing situations will be repeated under nicotine and under placebo, the order of administration of these two being randomized.

Changes in performance under the two drug conditions, as well as under stress and nonstress situations, will be computed for each individual and for the group. The significance of the difference in these changes will be tested, using an electronic computer.

6. Budget Plan:

Salaries (Including fringe benefits)	\$ 6,250.
Expendable Supplies	800.
Computer and computation service	750.
Overhead (33 1/3%)	2,733.
Other (subject fees)	400.
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	\$10,933.

7. Anticipated Duration of Work:

Eight months from receipt of grant until completion of the written report.

8. Facilities and Staff Available:

Adequate space for testing is available in the new Mental Health Research Institute in Ann Arbor, Michigan. Electronics engineer and technicians available as necessary to maintain the apparatuses. We have access to an LGP-30 computer. The Principal Investigator will be assisted by several research assistants currently working on other behavioral investigations, including Mr. Kent Marquis.

9. Additional Requirements: None.

10. Additional Information (Including relation of work to other projects and other sources of supply): This research design is developed after consideration of the findings of our previous study on which we have submitted a report to you entitled "Performance, Personality, and Physiological Correlates of Smoking as Related to Stress." The IOTA apparatus is a new model of a device based on previous research by us outlined in the attached reprint "Information Input Overload and Psychopathology." These two recent investigations are part of a continuing program of study of behavioral effects of drugs, alcohol, and tobacco.

The check for support of this research should be made payable to the industrial consulting organization through which we work, Behavioral Science Research, Inc., and mailed in care of Dr. James G. Miller, Director, Mental Health Research Institute, The University of Michigan, Ann Arbor, Michigan.

/s/ James G. Miller
Director of Project